

A

Academic research and development. *See also* Research and development (R&D)

- article output per \$1 million of, 8.108f, 8.109t
- as share of GDP, 8.102f, 8.103t
- bricks and mortar infrastructure for, 5.15–18
- by institution, 5.13–15
- collaborative, 5.27
- congressional earmarks for, 5.10
- cyberinfrastructure for, 5.18–19
- demographics of researchers in, 5.22–25
- Department of Agriculture in, 5.12t
- Department of Defense in, 5.12t
- Department of Energy in, 5.12t
- doctoral scientists and engineers in, 5.25–27
- employment trends in, 5.19–31, 5.32f, 5.32t
- Environmental Protection Agency in, 5.12t
- expenditures
 - by field, 5.11–13
 - by funding source, 5.7–11
 - in agricultural and natural resources, 5.16f
 - in biological and biomedical sciences, 5.16f
 - in computer and information sciences, 5.16f
 - in engineering, 5.16f
 - in medical sciences, 5.16f
 - in physical sciences, 5.16f
- federal support of, 5.9–10
- top agencies in, 5.10
- financial resources for, 5.7–15, 5.12t
- government support of academic doctoral researchers, 5.28–31
- in computer sciences, 5.13f
- in engineering, 5.13f
- in environmental sciences, 5.13f
- in life sciences, 5.13f
- in mathematics, 5.13f
- in physical sciences, 5.13f
- in psychology, 5.13f
- in social sciences, 5.13f
- industry funding for, 5.11
- infrastructure, 5.15–19
- institutional funds for, 5.10
- interdisciplinary, 5.53, note 31
- internal institutional networks in, 5.19
- Internet access and, 5.18–19
- life sciences, 5.13f
- National Aeronautics and Space Administration in, 5.12t
- National Institutes of Health in, 5.12t
- National Science Foundation in, 5.12t
- non-science and engineering, 5.13
- output of, 5.32–50
- racial/ethnic groups in, 5.23–25
- recent doctorate holders in, 3.34–35, 5.21–26, 5.28
- space for, 5.16–17
 - by field, 5.17t
 - in agricultural sciences, 5.17t
 - in biological sciences, 5.17t
 - in computer sciences, 5.17t
 - in mathematics, 5.17t
 - in physical sciences, 5.17t
 - in psychology, 5.17t
 - in social sciences, 5.17t
 - new construction of, 5.16–17

- state and local government funding for, 5.10–11
- USDA in, 5.12t
- within national research and development enterprise, 5.7
- women in, 5.22–23

Achievement gaps, in mathematics, 1.13, 1.13t

Aerospace

- patents, 6.51f
- value added in, 6.24f

Agency for International Development (AID), 4.32t, 4.35t

Agriculture, value added in, 6.27t

AID. *See* Agency for International Development (AID)

Alabama. *See* Chapter 8

Alaska. *See* Chapter 8

Angel investment, 6.57–58, 6.58f, 6.59f

Animals, research on, public attitudes about, 7.43–44

Apple iPad, 6.30, 6.30t

Argentina

- Articles coauthored with United States, 5.39t
- international collaboration on articles in, 5.38t
- journal articles from, 5.34t
- research and development expenditures as share of GDP, 4.45t

Arizona. *See* Chapter 8

Arkansas. *See* Chapter 8

Asia. *See also* specific countries

- article collaboration in, 5.38t
- ascent of, O.3
- business services in, 6.24f
- citation of papers from, 5.44f
- citations in articles from, O.14f
- communications equipment in, 6.24f
- computer and office machinery manufacturing in, O.16f
- doctorate recipients from, 2.29, 2.29f, 2.29t
- education services in, 6.13t
- exports of high-technology products, 6.35f
- financial services in, 6.33f
- gross domestic product (GDP)
 - per capita, 6.16f
 - per employed person, 6.15f
- health services in, 6.13t
- high-technology manufacturing, O.16, 6.22f, 6.24f
 - consumption of high-technology products, 6.23, 6.23f
 - growth of, 6.20f
 - value added in, O.16f, 6.22f, 6.24f
- high-value patents from, O.14f
- highly cited works from, 5.46f
- information and communication technology
 - exports, O.17, 6.35f, 6.36t
 - imports, 6.37f
 - output of, 6.13f
 - value added, 6.21f, 6.24f
- journal articles produced in, O.10f, 5.32–41
 - in engineering, O.10f
- knowledge- and technology-intensive industry in, 6.12f, 6.13f
- knowledge-intensive industry as share of GDP, O.15f
- manufacturing value added, 6.29t
- research and development expenditures, O.4f, O.5f, 4.40–52
- trade balance in, O.19f, 6.29–42
- U.S. advanced technology trade with, 6.34
- U.S. patent grants to, O.14f
- value of knowledge-intensive services in, O.15f

Australia

- article collaboration in, 5.38t

- broadband penetration in, 6.17*f*
- coauthorship from, with United States, 5.39*t*
- educational attainment in, 2.33*f*
- foreign students in, 2.36*f*
- industrial research and development in, 4.45*t*
- international collaboration on articles in, 5.38*t*
- journal articles from, 5.34*t*
- research and development by U.S. companies in, 4.29*t*
- research and development expenditures as share of GDP, 4.45*t*, 4.46*f*

Austria

- coauthorship from, with United States, 5.39*t*
- educational attainment in, 2.33*f*
- foreign students in, 2.36*f*
- journal articles from, 5.34*t*
- research and development expenditures as share of GDP, 4.45*t*

B

Belarus, research and development expenditures as share of GDP, 4.45*t*

Belgium

- coauthorship from, with United States, 5.39*t*
- educational attainment in, 2.33*f*
- foreign students in, 2.36*f*
- industrial research and development in, 4.45*t*
- international collaboration on articles in, 5.38*t*
- journal articles from, 5.34*t*
- research and development by U.S. companies in, 4.29*t*
- research and development expenditures as share of GDP, 4.45*t*

Bibliometric data. See *Literature, scientific and technical*

Biotechnology

- patents, 6.53
- public attitudes about, 7.40–41

Bologna Process, 2.32, 2.34

Brazil

- coauthorship from, with United States, 5.39*t*
- international collaboration on articles in, 5.38*t*
- journal articles from, 5.34*t*
- research and development by U.S. companies in, 4.29*t*
- tertiary education achievement in, 0.7*f*

Broadband penetration, in selected region/country, 6.17*f*

C

California. See *Chapter 8*

- research and development in, 4.12*t*

Canada

- article collaboration in, 5.38*t*
- broadband penetration in, 6.17*f*
- coauthorship from, with United States, 5.39*t*
- doctorate recipients from, 2.29*t*, 2.31*f*
- educational attainment in, 2.33*f*
- enrollment in U.S. undergraduate programs, 2.19*f*
- foreign students in, 2.36*f*
- GDP in, by sector, 4.44*f*
- H-1B holders from, 3.51*f*
- immigrants from, education of, 3.53*f*
- industrial research and development in, 4.45*t*
- international collaboration on articles in, 5.38*t*
- journal articles from, 5.34*t*
- research and development by U.S. companies in, 4.29*t*
- research and development expenditures as share of GDP, 4.45*t*, 4.46*f*
- stay rates of doctorate recipients from, 3.53*f*
- U.S. advanced technology trade with, 6.34

Carnegie Classification of Institutions of Higher Education, 2.8

Charts, understanding of, 7.26

Chile

- educational attainment in, 2.33*f*
- foreign students in, 2.36*f*

- journal articles from, 5.34*t*

- research and development expenditures as share of GDP, 4.45*t*

China

- article collaboration in, 5.39*t*, 5.38*t*
- citation of papers from, 0.14*f*, 5.44*f*
- citation patterns, 0.14*f*
- coauthorship from, with United States, 5.39*t*
- commercial knowledge-intensive services, 6.24*f*
- communications equipment manufacturing in, 6.24*f*
- computer and office machinery manufacturing in, 0.16*f*
- doctoral degrees in, 0.8*f*
- doctorate recipients from, 2.29*t*, 2.29*f*
- education services in, 6.13*t*
- enrollment in U.S. undergraduate programs, 2.19*f*
- exports of commercial knowledge-intensive services, 0.17*f*
- exports of high-technology products, 6.35*f*
- exports to selected countries, 0.18*f*
- financial services in, 6.33*f*
- gross domestic product
 - by sector, 4.44*f*
 - per capita, 6.16*f*
 - per employed person, 6.15*f*
- H-1B holders from, 3.51*f*
- health services in, 6.13*t*
- high-technology manufacturing
 - consumption of high-technology products, 6.23*f*
 - value added in, 0.16, 6.22*f*, 6.24*f*
 - high-value patents from, 0.14*f*
- highly cited works from, 5.46*f*
- immigrants from, education of, 3.53*f*
- information and communication technology
 - export share, 0.17*f*
 - imports, 6.37*f*, 6.39*f*
 - output of, 6.13*f*
 - value added, 6.21*f*, 6.24*f*
- international collaboration on articles in, 5.38*t*
- journal articles from, 0.10*f*, 5.34*t*
 - in engineering, 0.10*f*, 0.11*f*
- knowledge- and technology-intensive industry output in, 6.12*f*, 6.13*f*
- knowledge-intensive industry as share of GDP, 0.15*f*
- manufacturing value added, 6.24*f*, 6.29*t*
- patent trends in, 6.50
- research and development by U.S. companies in, 4.29*t*
- research and development expenditures, 0.4, 0.5*f*
 - as share of GDP, 4.45*t*, 4.46*f*
- researcher numbers in, 0.9–10, 0.9*f*
- South Korea exports to, 0.18*f*
- stay rates of doctorate recipients from, 3.53*f*
- supercomputers in, 6.25, 6.25*f*
- Taiwan exports to, 0.18*f*
- tertiary education achievement in, 0.7*f*
- trade balance in, 0.19*f*
- U.S. advanced technology trade with, 6.41–42
- U.S. patent grants to, 0.14*f*
 - value of knowledge-intensive services in, 0.15*f*

Climate change, public attitudes about, 7.36–38

Cloning, public attitudes about, 7.40–41

Colorado. See *Chapter 8*

Commercial knowledge-intensive services industries, 6.11–12, 6.20*f*

Commercial services, non-knowledge-intensive, 6.26

Common Core State Standards, 1.18

Computer specialists, as share of workforce, 8.84*f*, 8.85*t*

Connecticut. See *Chapter 8*

- research and development in, 4.12*t*

Construction, value added in, 6.27*f*

Croatia

journal articles from, 5.34*t*
 research and development expenditures as share of GDP, 4.45*t*
 Cuba, international mobility of students, 2.36*f*
 Czech Republic
 educational attainment in, 2.33*f*
 foreign students in, 2.36*f*
 high school graduation rate in, 1.33*f*
 industrial research and development in, 4.45*t*
 international collaboration on articles in, 5.38*t*
 journal articles from, 5.34*t*
 research and development expenditures as share of GDP, 4.45*t*

D

Delaware. *See Chapter 8*

Denmark

 coauthorship from, with United States, 5.39*t*
 educational attainment in, 2.33*f*
 foreign students in, 2.36*f*
 high school graduation rate in, 1.33*f*
 international collaboration on articles in, 5.38*t*
 journal articles from, 5.34*t*
 research and development expenditures as share of GDP, 4.45*t*, 4.46*f*
 Department of Agriculture (USDA), 4.32*t*, 4.33, 4.35*t*, 4.36*f*, 4.37*f*, 5.12*t*
 Department of Commerce (DOC), 4.32*t*, 4.33, 4.35*t*, 4.36*f*, 4.37*f*
 Department of Defense (DOD), 4.31, 4.32*t*, 4.35*t*, 4.36*f*, 4.37*f*, 5.12*t*
 Department of Education (ED), 4.32*t*, 4.35*t*
 Department of Energy (DOE), 4.32*t*, 4.32–33, 4.35*t*, 4.36*f*, 4.37*f*, 5.12*t*
 Department of Health and Human Services (HHS), 4.31–32, 4.32*t*, 4.35*t*, 4.36*f*, 4.37*f*
 Department of Homeland Security (DHS), 4.32*t*, 4.33, 4.35*t*, 4.36*f*
 Department of the Interior (DOI), 4.32*t*, 4.35*t*
 Department of Transportation (DOT), 4.32*t*, 4.35*t*
 DHS. *See* Department of Homeland Security (DHS)
 District of Columbia. *See Chapter 8*
 research and development in, 4.12*t*
 DOC. *See* Department of Commerce (DOC)
 DOD. *See* Department of Defense (DOD)
 DOE. *See* Department of Energy (DOE)
 DOI. *See* Department of the Interior (DOI)
 DOT. *See* Department of Transportation (DOT)

E

ED. *See* Department of Education (ED)

Education. *See also* Academic research and development; Students

 Advanced Placement program, 8.34*f*, 8.35*t*, 8.36*f*, 8.37*t*, 8.38*f*, 8.39*t*
 associate's degrees
 in science and engineering, 2.20
 or higher among 25–44-year-olds, 8.70*f*, 8.71*t*
 bachelor's degrees, 2.20–23
 by citizenship, 2.22
 by field, 2.20*f*
 by race/ethnicity, 2.21–22, 2.22*f*
 female share of, 2.21*f*
 holders potentially in workforce, 8.74, 8.74*f*, 8.75*t*
 minority share of, 2.22*f*
 or higher among 25–44-year-olds, 8.72*f*, 8.73*t*
 per 1,000 18–24-year-olds, 8.42*f*, 8.43*t*
 in science and engineering, 8.44*f*, 8.45*t*
 in natural sciences and engineering, 8.46*f*, 8.47*t*
 in charter schools, 1.11
 Carnegie Classification of Institutions of Higher Education, 2.8
 Common Core State Standards in, 1.18
 community colleges, 2.8–9
 distance, 2.10
 doctoral degrees, 0.8*f*, 2.26–31

 article output per 1,000 holders of, 8.106*f*, 8.107*t*
 by citizenship, 2.29*f*, 2.30*f*
 by country/economy of origin, 2.29–2.31, 2.29*t*, 2.30*t*, 2.31*t*
 by field, 2.27*f*
 by race/ethnicity, 2.27–28, 2.28*f*, 2.29*f*
 by sex, 2.27
 completion and attrition, 2.27
 conferred in S&E per 1,000 employed S&E doctorate holders, 8.104*f*, 8.105*t*
 employed holders of, as share of workforce, 8.78*f*, 8.79*t*
 foreign recipients, 2.28, 2.29–31, 2.29*f*, 2.29*t*, 2.30*t*, 2.31*t*
 global comparison of, 2.34
 globalization and, 2.34–37
 labor market for, 3.33–40
 patents per 1,000 holders of science and engineering, 8.110*f*, 8.111*t*
 salaries for holders of, 3.36
 stay rates, 3.50–52, 3.53*f*
 tenure-track positions for holders of, 3.35–36
 time to completion, 2.27, 2.28*t*
 unemployment among holders of, 3.35
 expenditures, U.S.
 as share of GDP, 8.30*f*, 8.31*t*
 per pupil, 8.32*f*, 8.33*t*
 financial aid for, 2.11–16, 8.66*f*, 8.67*t*
 graduate, in United States, 2.24–31
 in science and engineering per 1,000 25–34 year olds, 8.52*f*, 8.53*t*
 graduation rates, 1.30–31, 1.32*t*, 1.33*f*
 high school completion, 1.30–31, 8.40*f*, 8.41*t*
 higher
 advanced science and engineering degrees as share of total science and engineering degrees, 8.54*f*, 8.55*t*, 8.56*f*, 8.57*t*
 associate's degrees, 2.20
 bachelor's degrees, 2.20–23
 by country, 0.7*f*
 cost of, 2.11, 2.11*f*
 distance, 2.10
 for-profit institutions, 2.9
 immediate enrollment in, 1.30
 online, 2.10
 overview of U.S., 2.7–15
 transition to, 1.30–34
 workforce trends and, 0.7–8
 international expenditures on higher, 2.32
 international mobility of students, 2.34–37
 master's degrees, 2.25–26
 by citizenship, 2.26
 by field, 2.25*f*
 by race/ethnicity, 2.26, 2.26*f*
 by sex, 2.25, 2.25*f*
 professional, 2.25
 mathematics (precollege)
 eighth grade performance in, 1.9–12 1.11*f*, 1.12*t*, 1.13*t*, 8.20*f*, 8.21*t*
 eighth grade proficiency in, 8.22*f*, 8.23*t*
 elementary student performance in, 1.8–12, 1.10*t*
 fourth grade performance in, 1.9–12 1.11*f*, 1.12*t*, 1.13*t*, 8.12*f*, 8.13*t*
 fourth grade proficiency in, 8.14*f*, 8.15*t*
 gap changes in, 1.13, 1.13*t*
 international assessments of, 1.14–15
 middle grade student performance in, 1.8–12, 1.10*t*
 proficiency in different skill areas, 1.13–14, 1.14*f*
 public attitudes about, 7.44
 race/ethnicity and achievement in, 1.10*t*
 skills areas, 1.14
 national assessments, 1.8–14
 of immigrants to United States, 3.48

- relationship of employment and, 3.16–17
- science (precollege)
 - achievement gaps in, 1.13
 - and engineering degrees as share of total degrees, 8.48*f*, 8.49*t*, 8.50*f*, 8.51*t*
 - eighth grade performance in, 8.24*f*, 8.25*t*
 - eighth grade proficiency in, 8.26*f*, 8.27*t*
 - fifteen-year-olds' performance in, 1.15
 - fourth grade performance in, 8.16*f*, 8.17*t*
 - fourth grade proficiency in, 8.18*f*, 8.19*t*
 - public attitudes about, 7.44
 - rising performance in, 1.13
- state achievement tests, 1.23
- teachers (precollege)
 - attrition, 1.28–29, 1.29*f*
 - certification of, 1.22–1.24
 - experience of, 1.25
 - formal preparation of, 1.22–25
 - professional development of, 1.26–28, 1.27*f*, 1.28*f*
 - quality of, 1.22–25
 - salaries of, 1.28, 1.30*f*, 8.28*f*, 8.29*t*
 - subject area preparation of, 1.25–26, 1.26*t*
 - working conditions, 1.28–30, 1.31*f*
- undergraduate
 - average cost of, 8.60*f*, 8.61*t*
 - as share of disposable income, 8.62*f*, 8.63*t*
 - degree awards, 2.20–22
 - in United States, 2.16–23
- Egypt
 - journal articles from, 5.34*t*
 - research and development expenditures as share of GDP, 4.45*t*
- Employment. *See also* Workforce, science and engineering
 - in high technology as share of total, 8.118*f*, 8.119*t*
- Energy
 - investment in, 6.60–68
 - patents, 5.48–50, 6.65–69
- Engineers, as share of workforce, 8.80*f*, 8.81*t*
- Environment, public attitudes about, 7.36–40
- Environmental Protection Agency (EPA), 4.32*t*, 4.35*t*, 5.12*t*
- EPA. *See* Environmental Protection Agency (EPA)
- EPSCoR. *See* Experimental Program to Stimulate Competitive Research (EPSCoR)
- Estonia, educational attainment in, 2.33*f*
- EU. *See* European Union (EU)
- European Union (EU)
 - article collaboration in, 5.38*t*
 - broadband penetration in, 6.17*f*
 - China exports to, O.18*f*
 - citation of papers from, 5.44*f*
 - communications equipment manufacturing in, 6.24*f*
 - computer and office machinery manufacturing market shares, O.16*f*
 - doctorate recipients from, 2.30, 2.30*f*
 - education services in, 6.13*t*
 - export share, knowledge-intensive services, O.17*f*
 - exports of high-technology products, 6.35*f*
 - financial services in, 6.12*f*
 - gross domestic product, per employed person, 6.15*f*
 - health services in, 6.13*t*
 - high-technology manufacturing
 - consumption of high-technology products, 6.23*f*
 - value added in, O.16, 6.22*f*, 6.24*f*
 - high-value patents from, O.14*f*
 - highly cited works from, 5.46*f*
 - knowledge- and technology-intensive industries
 - exports, O.17*f*
 - output of, 6.12*f*
 - trade balance in, O.19*f*
 - value added, 6.21*f*, 6.24*f*
 - journal articles produced by, O.10*f*
 - in engineering, O.10*f*, O.11*f*
 - knowledge- and technology-intensive industry output in, 6.12*f*, 6.13*f*
 - knowledge-intensive services in, O.15*f*
 - manufacturing value added, 6.24*f*, 6.29*t*
 - research and development expenditures, O.4*f*, O.5*f*
 - as share of GDP, 4.45*t*
 - researcher numbers in, O.9–10, O.9*f*
 - South Korea exports to, O.18*f*
 - Taiwan exports to, O.18*f*
 - trade balance in, O.19*f*
 - U.S. advanced technology trade with, 6.34
 - U.S. patent grants to, O.14*f*
 - value added of knowledge-intensive services in, O.15*f*
- Evolution
 - public attitudes about teaching of, 7.37, 7.41–42
 - public knowledge about, 7.20
- Experimental Program to Stimulate Competitive Research (EPSCoR), 5.11, 5.12, 8.8–9. *See also* Chapter 8
- Exports. *See also* Globalization; Trade
 - of knowledge-intensive services, O.17*f*
 - of high-technology products by selected region/country/economy, 6.35*f*
 - of medium- and low-technology products, 6.39
 - trade patterns and, O.17–18
 - valuation of, 6.11
- F**
- Federal government, U.S.
 - as research and development funding source, 4.13–15
 - as research and development performers, 4.12
 - employment by, 3.24
 - in research and development, 4.28–37
 - by agency, 4.31–33, 4.31*f*
 - by field, 4.33–35, 4.37*f*
 - by national objective, 4.28–30
 - by performer, 4.31–33
 - civilian-related, 4.30
 - defense-related, 4.28–30
 - in federal budget, 4.28–30, 4.31*f*
 - obligations per civilian worker, 8.90*f*, 8.91*t*
 - obligations per individual in science and engineering
 - occupation, 8.92*f*, 8.93*t*
 - tax credits, 4.35–37
 - public opinion on funding of scientific research by, 7.29–32
 - research and development by, 4.28–37
 - technology transfer by, 4.38, 4.39, 4.40
- Financial services, 6.33*f*
- Finland
 - coauthorship from, with United States, 5.39*t*
 - high school graduation rate in, 1.33*f*
 - industrial research and development in, 4.45*t*
 - international collaboration on articles in, 5.38*t*
 - international mobility of students from, 2.36*f*
 - journal articles from, 5.34*t*
 - research and development expenditures as share of GDP, 4.45*t*
- Florida. *See* Chapter 8
- Foreign direct investment (FDI)
 - in knowledge- and technology-intensive industries, 6.45–46
 - in research and development, 4.25
- France
 - article collaboration in, 5.38*t*

broadband penetration in, 6.17f
 coauthorship from, with United States, 5.39t
 doctoral degrees, 2.30f
 educational attainment in, 2.33f
 first university degrees in, 0.8f
 GDP in, by sector, 4.44f
 H-1B holders from, 3.51f
 industrial research and development in, 4.45t
 international collaboration on articles in, 5.38t, 5.41t
 international mobility of students from, 2.36f
 journal articles from, 5.34t
 research and development by U.S. companies in, 4.29t
 research and development expenditures as share of GDP, 4.45t, 4.46f, 4.47t

G

GDP. See Gross domestic product (GDP)
 Genetically modified (GM) food, public attitudes about, 7.42
 Georgia. See *Chapter 8*
 Germany
 academic research and development expenditures in, 4.52f
 article collaboration in, 5.38t
 broadband penetration in, 6.17f
 coauthorship from, with United States, 5.39t
 doctorate recipients from, 2.29t
 educational attainment in, 2.33f
 first university degrees in, 0.8f
 foreign students in, 2.36f
 GDP in, by sector, 4.44f
 H-1B holders from, 3.51f
 high school graduation rate in, 1.33f
 immigrants from, education of, 3.53f
 industrial research and development in, 4.45t, 4.50f
 international collaboration on articles in, 5.38t
 journal articles from, 5.34t
 research and development by U.S. companies in, 4.29t
 research and development expenditures as share of GDP, 4.45t, 4.46f
 stay rates of doctorate recipients from, 3.53f
 tertiary education achievement in, 0.7f
 Global warming. See Climate change
 Globalization. See also Exports; Trade
 doctoral education and, 2.34–37
 of knowledge-intensive services industries, 6.29–46
 value chain and, 6.30–31
 GM. See Genetically modified (GM) food
 Greece
 coauthorship from, with United States, 5.39t
 educational attainment in, 2.33f
 first-time entry rates into postsecondary education, 1.39t
 foreign students in, 2.36f
 high school graduation rate in, 1.33f
 journal articles from, 5.34t
 research and development expenditures as share of GDP, 4.45t
 Gross domestic product (GDP)
 academic research and development as share of, 8.102f, 8.103t
 comparison of, for selected countries by sector, 4.44f
 education expenditures as share of, U.S., 8.30f, 8.31t
 information and communication technology as share of, 6.13f
 knowledge-intensive industry output as share of, 6.12f
 research and development as share of, 0.4–5, 0.5f, 8.88f, 8.89t
 from state agencies, 8.94f, 8.95t
 research and development ratio with, in U.S. states, 4.11, 4.12t
 technology manufacturing as share of, 6.13f

H

H-1B visas, 3.49–50, 3.51f, 3.52t
 Hawaii. See *Chapter 8*

Health services, 6.12–13, 6.13t
 HHS. See Department of Health and Human Services (HHS)
 Hong Kong, research and development by U.S. companies in, 4.29t
 Human cloning, public attitudes about, 7.40–41
 Hungary
 educational attainment in, 2.33f
 foreign students in, 2.36f
 high school graduation rate in, 1.33f
 journal articles from, 5.34t
 research and development expenditures as share of GDP, 4.45t

I

Iceland
 educational attainment in, 2.33f
 high school graduation rate in, 1.33f
 research and development expenditures as share of GDP, 4.45t
 ICT. See Information and communications technology (ICT)
 Idaho. See *Chapter 8*
 Illinois. See *Chapter 8*
 research and development in, 4.11, 4.12t
 Imports, valuation of, 6.11
 India
 coauthorship from, with United States, 5.39t
 doctoral degrees in, 0.8f
 doctorate recipients from, 2.29t, 2.29f
 enrollment in U.S. undergraduate programs, 2.19f
 H-1B holders from, 3.51f
 immigrants from, education of, 3.53f
 international collaboration on articles in, 5.38t
 journal articles
 from, 5.34t
 in engineering, 0.11f
 patent trends in, 6.50
 research and development by U.S. companies in, 4.29t
 stay rates of doctorate recipients from, 3.53f
 tertiary education achievement in, 0.7f, 2.33f
 Indiana. See *Chapter 8*
 Indonesia, tertiary education achievement in, 0.7f
 Information and communications technology (ICT). See also Knowledge- and technology-intensive (KTI) industries
 as share of GDP, 6.13f
 China imports of, 6.37f
 exports, from Asia, 6.36t, 6.37f
 importance of, 6.14
 imports of, 6.37f, 6.39f
 indicators, 6.14–15
 industries in, 6.14–15
 Japan exports of, 6.36t
 manufacturing and, 6.44–45
 output in, as share of GDP, 6.13f
 patenting, 6.51–53, 6.52t
 spending, by region/country, 6.13f
 trade balance of, 6.34f
 value added of, 6.21f, 6.24f, 6.25–26
 Innovation-related metrics, 4.18, 6.46–60
 Interdisciplinary research, 5.53, note 31
 Internet access
 academic research and development and, 5.18–19
 broadband penetration and, 6.17f
 Iowa. See *Chapter 8*
 iPad, 6.30f
 Iran
 immigrants from, education of, 3.53f
 journal articles from, 5.34t
 research and development expenditures as share of GDP, 4.45t
 stay rates of doctorate recipients from, 3.53f
 Ireland

- educational attainment in, 2.33*f*
- high school graduation rate in, 1.33*f*
- industrial research and development in, 4.45*t*
- international mobility of students from, 2.36*f*
- journal articles from, 5.34*t*
- research and development by U.S. companies in, 4.29*t*
- research and development expenditures as share of GDP, 4.45*t*, 4.46*f*

Israel

- coauthorship from, with United States, 5.39*t*
- educational attainment in, 2.33*f*
- journal articles from, 5.34*t*
- research and development by U.S. companies in, 4.29*t*
- research and development expenditures as share of GDP, 4.45*t*, 4.46*f*

Italy

- article collaboration in, 5.38*t*
- coauthorship from, with United States, 5.39*t*
- educational attainment in, 2.33*f*
- foreign students in, 2.36*f*
- GDP in, by sector, 4.44*f*
- high school graduation rate in, 1.33*f*
- industrial research and development in, 4.45*t*
- international collaboration on articles in, 5.38*t*
- journal articles from, 5.34*t*
- research and development by U.S. companies in, 4.29*t*
- research and development expenditures as share of GDP, 4.45*t*, 4.46*f*

J

Japan

- academic research and development expenditures in, 4.52*f*
- article collaboration in, 5.39*t*, 5.38*t*
- broadband penetration in, 6.17*f*
- business services in, 6.33*f*
- China exports to, O.18*f*
- citation of papers from, 5.44*t*
- coauthorship from, with United States, 5.39*t*
- commercial knowledge-intensive services in, 6.24*f*
- communication services in, 6.24*f*
- computer and office machinery manufacturing in, O.16*f*
- doctoral degrees in, O.8*f*
- doctorate recipients from, 2.29*t*
- education services in, 6.13*t*
- educational attainment in, tertiary, 2.33*f*
- enrollment in U.S. undergraduate programs, 2.19*f*
- export share, high-technology, O.17*f*
- exports of high-technology products, 6.35*f*
- exports to China, O.18*f*
- exports to U.S., O.18*f*
- financial services in, 6.33*f*
- foreign students in, 2.36*f*
- gross domestic product
 - by employed person, 6.15*f*
 - by sector, 4.44*f*
- H-1B holders from, 3.51*f*
- health services in, 6.13*t*
- high school graduation rate in, 1.33*f*
- high-technology manufacturing
 - consumption of high-technology products, 6.23*f*
 - value added in, O.16, 6.22*f*, 6.24*f*
- high-value patents from, O.14*f*
- highly cited works from, 5.46*f*
- immigrants from, education of, 3.53*f*
- industrial research and development in, 4.45*t*
- information and communication technology
 - exports, O.17*f*, 6.36*t*
 - imports, 6.37*f*
 - output of, 6.13*f*

- value added, 6.21*f*, 6.24*f*
- international collaboration on articles in, 5.38*t*
- journal articles produced in, O.10, 5.32–41
 - in engineering, O.11*f*
- knowledge- and technology-intensive industry output in, 6.12*f*, 6.13*f*
- knowledge-intensive services in, O.15*f*
- manufacturing value added, 6.29*t*
- research and development by U.S. companies in, 4.29*t*
- research and development expenditures, O.5*f*, 4.40–52
 - as share of GDP, 4.45*t*, 4.46*f*
- researcher numbers in, O.9, O.9*f*
- stay rates of doctorate recipients from, 3.53*f*
- tertiary education achievement in, O.7*f*, 2.33*f*
- trade balance in, O.19*f*, 6.29–42
- U.S. advanced technology trade with, 6.41–42, 6.43*f*
- U.S. patent grants to, O.14*f*
- value added of knowledge-intensive services in, O.15*f*, 6.20*f*

Journal articles, O.9–11, 5.32–45

- author names in, 5.35–36
- by country/economy, 5.34*t*
- citations in
 - research patterns and, O.12
 - trends in, 5.43–45
- coauthorship of, O.11–12, O.11*f*, 5.35–40,
 - collaboration on, 5.35–40
- engineering, in selected regions/countries, O.11*f*
- highly cited, 5.43–45, 5.46*f*
- international coauthorship of, with United States, 5.39*t*
- output by sector, 5.41–43
- patent citations to, 5.48–50
- per \$1 million of academic research and development, 8.108*f*, 8.109*t*
- per 1,000 science and engineering doctorate holders, 8.106*f*, 8.107*t*

K

Kansas. See *Chapter 8*

Kentucky. See *Chapter 8*

Knowledge- and technology-intensive (KTI) industries

- commercial service, 6.11–12
- data and terminology in, 6.11
- foreign direct investment in, 6.45–46
- global output of, 6.12*f*
- globalization and, 6.29–46
- in education sector, 6.12–13
- in health sector, 6.12–13
- in world economy, 6.10–17
- investment in, 6.45–46
- multinational companies in, 6.42–45
- output of, by selected region/country, 6.13*f*
- trade and, 6.29–46
- value added of, global, 6.12*f*
- worldwide distribution of, 6.17–28

Knowledge-intensive firms, rising output of, O.15–16

Korea. See South Korea

KTI. See Knowledge- and technology-intensive (KTI) industries

L

Leadership, public confidence in scientific, 7.31–32, 7.31*t*

Literature, scientific and technical

- as research output, O.9–11, O.10*f*
- author names in, 5.35–36
- bibliometric terminology, 5.33
- by country/economy, 5.34*t*
- citations in, O.12, 5.43–45
- coauthorship of, O.11*f*, 5.35–40
- collaboration on, 5.35–41

engineering, in selected regions/countries, O.11f
 highly cited, 5.43–45, 5.46f
 international coauthorship of, with United States, 5.38–39, 5.39t
 output by sector, 5.41–42
 patent citations to, 5.48–50
 per \$1 million of academic research and development, 8.108f, 8.109t
 per 1,000 science and engineering doctorate holders, 8.106f, 8.107t
 Louisiana. See *Chapter 8*
 Luxembourg
 educational attainment in, 2.33f
 high school graduation rate in, 1.33f
 research and development expenditures as share of GDP, 4.45t

M

Maine. See *Chapter 8*
 Malaysia
 enrollment in U.S. undergraduate programs, 2.19f
 information and communication technology
 exports, 6.35f, 6.36t
 imports, 6.37f
 research and development by U.S. companies in, 4.29t
 research and development expenditures, O.4f
 Manufacturing
 computer and office machinery, value added, O.16f
 high-technology, O.15–16
 by selected region/country, O.16f
 consumption of products of, 6.23, 6.23f
 multinational companies in, 6.44–45
 value added of selected industries, by selected region/country/
 economy, 6.24f
 non-high-technology, 6.26–27
 trade balance trends in, 6.26–38
 value added for, 6.29t
 value chain geography of, 6.30
 value added of high-technology manufacturing, O.16f
 Maryland. See *Chapter 8*
 research and development in, 4.12t
 Massachusetts. See *Chapter 8*
 research and development in, 4.12t
 Mathematics (precollege)
 achievement gaps, 1.13, 1.13t
 achievement in charter schools, 1.11, 1.11f
 eighth grade performance in, 1.8–12 1.11f, 1.12t, 1.13t, 8.20f, 8.21t
 eighth grade proficiency in, 8.22f, 8.23t
 elementary student performance in, 1.8–12, 1.10t
 fifteen-year-olds' performance in, 1.15
 fourth grade performance in, 1.8–12 1.11f, 1.12t, 1.13t, 8.12f, 8.13t
 fourth grade proficiency in, 8.14f, 8.15t
 international assessments of, 1.14–15
 middle grade student performance in, 1.8–12
 proficiency in different skill areas, 1.13–14, 1.15f
 race/ethnicity and achievement in, 1.10t
 skills areas, 1.14
 Mexico
 coauthorship from, with United States, 5.39t
 doctorate recipients from, 2.29t, 2.31f
 educational attainment in, 2.33f
 first university degrees in, O.7f
 H-1B holders from, 3.51f
 high school graduation rate in, 1.33f
 international collaboration on articles in, 5.38t
 journal articles from, 5.34t
 research and development expenditures as share of GDP, 4.45t
 stay rates of doctorate recipients from, 3.53f
 Michigan. See *Chapter 8*
 research and development in, 4.12t

Migration. See Workforce, science and engineering, immigrants in
 Mining, 6.27f

Minnesota. See *Chapter 8*

Minorities. See also Race/ethnicity
 bachelor's degree attainment by, 2.21–22, 2.22f
 doctoral degree attainment by, 2.27–28, 2.28f, 2.29f
 in academic research and development, 5.23–24, 5.24t
 in S&E workforce, 3.43–47
 master's degree attainment by, 2.26, 2.26f
 mathematics achievement by, 1.10t

Mississippi. See *Chapter 8*

Missouri. See *Chapter 8*

MNCs. See Multinational companies (MNCs)

Montana. See *Chapter 8*

Morocco, research and development expenditures as share of GDP,
 4.45t

Multinational companies (MNCs)
 employment in, 3.58–60
 in knowledge- and technology-intensive industries, 6.42–45
 research and development by, 4.25–27
 employment, O.9f
 overseas, O.5–6
 research and development employment by, O.9f, 3.58–60

N

NAEP. See National Assessment of Educational Progress (NAEP)
 assessments

NAGB. See National Assessment Governing Board (NAGB)

NAICS. See North American Industry Classification System (NAICS)
 codes

Nanotechnology
 public attitudes about, 7.21, 7.23
 public knowledge of, 7.23f

NASA. See National Aeronautics and Space Administration (NASA)

National Aeronautics and Space Administration (NASA), 4.26f, 4.32t,
 4.33, 4.35t, 4.36f, 4.37f, 5.12t

National Assessment Governing Board (NAGB), 1.8

National Assessment of Educational Progress (NAEP) 1.8–14, 1.10t,
 1.11f, 1.12t, 1.13t

National Institutes of Health (NIH), 5.12t

National Mathematics Advisory Panel, 1.8

National Science Foundation (NSF), 4.32t, 4.33, 4.35t, 4.36f, 4.37f, 5.12t

NCLB. See No Child Left Behind (NCLB) Act

Nebraska. See *Chapter 8*

Nepal, enrollment in U.S. undergraduate programs, 2.19f

Netherlands

 article collaboration in, 5.38t
 broadband penetration in, 6.17f
 coauthorship from, with United States, 5.39t
 educational attainment in, 2.33f
 foreign students in, 2.36f
 industrial research and development in, 4.45t
 international collaboration on articles in, 5.38t
 journal articles from, 5.34t
 research and development by U.S. companies in, 4.29t
 research and development expenditures as share of GDP, 4.45t

Nevada. See *Chapter 8*

New Hampshire. See *Chapter 8*

 research and development in, 4.12t

New Jersey. See *Chapter 8*

 research and development in, 4.12t

New Mexico. See *Chapter 8*

 research and development in, 4.12t

New York. See *Chapter 8*

 research and development in, 4.12t

New Zealand

coauthorship from, with United States, 5.39t
 educational attainment in, 2.33f
 foreign students in, 2.36f
 high school graduation rate in, 1.33f
 international collaboration on articles in, 5.38t
 journal articles from, 5.34t
 research and development expenditures as share of GDP, 4.45t
 Nigeria, enrollment in U.S. undergraduate programs, 2.19f
 NIH. *See* National Institutes of Health (NIH)
 No Child Left Behind (NCLB) Act, 1.7, 1.21, 1.25, 1.30
 North American Industry Classification System (NAICS) codes, 8.11t
 North Carolina. *See* Chapter 8
 research and development in, 4.12t
 North Dakota. *See* Chapter 8
 Norway
 coauthorship from, with United States, 5.39t
 educational attainment in, 0.7f, 2.33f
 foreign students in, 2.36f
 high school graduation rate in, 1.33f
 industrial research and development in, 4.45t
 journal articles from, 5.34t
 research and development expenditures as share of GDP, 4.45t
 NSF. *See* National Science Foundation (NSF)
 Nuclear power, public attitudes about, 7.40

O

Ohio. *See* Chapter 8
 Oklahoma. *See* Chapter 8
 Oregon. *See* Chapter 8

P

Pakistan
 H-1B holders from, 3.51f
 journal articles from, 5.34t
 Patents
 as research output, 0.9–11
 by scientists and engineers, 3.28–29
 by technology area, 6.51–53, 6.53f, 6.51f
 citations to literature in, 5.48–50
 clean energy, 5.48–50, 6.65–69
 global trends in, 6.47–51
 high-value, for selected regions/countries, 0.14f
 in information and communication technology, 6.51–53, 6.52f
 inventive activity shown by, 0.12–14
 legislation, 6.49
 per 1,000 individuals in science and engineering, 8.112f, 8.113t
 per 1,000 science and engineering doctorate holders, 8.110f, 8.111t
 related activities and income, 5.45–46
 share of U.S. grants for selected regions/countries, 0.14f
 triadic, 6.53–54, 6.53f
 university trends and, 5.45
 Pennsylvania. *See* Chapter 8
 research and development in, 4.12t
 Pharmaceuticals
 exports of, 6.36t, 6.40f
 innovation in, 6.47f
 investment in, 6.46t
 patents, 6.51f, 6.52t
 value added of, 6.24f
 Philippines
 H-1B holders from, 3.51f
 immigrants from, education of, 3.53f
 information and communication technology exports, 6.36t, 6.37f
 tertiary education achievement in, 0.7f
 PISA. *See* Program for International Student Assessment (PISA)

Poland
 broadband penetration in, 6.17f
 coauthorship from, with United States, 5.39t
 educational attainment in, 2.33f
 foreign students in, 2.36f
 high school graduation rate in, 1.33f
 industrial research and development in, 4.45t
 international collaboration on articles in, 5.38t
 journal articles from, 5.34t
 research and development expenditures as share of GDP, 4.45t
 Portugal
 educational attainment in, 2.33f
 foreign students in, 2.36f
 journal articles from, 5.34t
 research and development expenditures as share of GDP, 4.45t
 Program for International Student Assessment (PISA), 1.14–15, 1.17f;
 Pseudoscience, 7.27
 Publishing. *See also* Literature, scientific and technical
 as research output, 0.9–11
 author names in, 5.35–36
 by country/economy, 5.34t
 citations in
 research patterns and, 0.12
 trends in, 5.43–45
 coauthorship in, 0.11f, 5.35–40
 collaboration in, 5.35–40
 engineering, in selected regions/countries, 0.11f
 highly cited works, 5.43–45, 5.46f
 international coauthorship in, with United States, 5.39t
 output by sector, 5.41–42
 patent citations, 5.48–50
 per \$1 million of academic research and development, 8.108f,
 8.109t
 per 1,000 science and engineering doctorate holders, 8.106f, 8.107t
 Puerto Rico. *See* Chapter 8

R

Race/ethnicity. *See also* Minorities
 bachelor's degree attainment by, 2.21–22, 2.22f
 doctoral degree attainment by, 2.27–28, 2.27f, 2.28f
 in academic research and development, 5.23–25
 master's degree attainment by, 2.26, 2.26f
 mathematics achievement by, 1.10t
 Republic of Korea. *See* South Korea
 Research. *See also* Academic research and development; Research
 and development
 applied, 4.15
 basic, 4.15
 citations and, 0.12
 collaboration, expansion of, 0.11–12
 institutions, in higher education system, 2.7
 on animals, public attitudes about, 7.43–44
 output, 0.9–11
 Research and development (R&D). *See also* Academic research and
 development
 academic sector, 4.52
 government funding mechanisms for, 4.52
 aerospace and defense, 4.21, 4.22t
 as share of GDP, 0.4–5, 0.5f, 8.88f, 8.89t
 automotive manufacturing, 4.21, 4.22t
 budget authority, 4.28–4.30, 4.31f
 business, 4.17–24, 4.48–52
 as share of private-industry output, 8.100f, 8.101t
 in top states, 4.12t
 by character of work, 4.15–16, 4.17f

by multinational companies, 4.25–27
 by performing sector, 4.44–46
 by source of funds, 4.44–46
 chemical, 4.21, 4.22*t*
 China, O.4–5, O.5*f*
 classification of, 4.15–16
 clean energy, 6.64–65
 computers and electronics, 4.21, 4.22*t*
 economic growth and, 4.17
 employment
 by multinational companies, 3.58–60
 of U.S.-based multinational corporations, O.9*f*
 expenditures
 as share of GDP, O.5*f*, 4.46*f*
 Asia, O.4*f*
 by character of work, 4.14*t*, 4.16*t*, 4.17*t*, 4.35*t*, 4.46*f*
 by performing sector and funding source, 4.9*t*, 4.13*f*, 4.35*t*
 by state agencies
 per \$1 million of GDP, 8.94*f*, 8.95*t*
 per civilian worker, 8.96*f*, 8.97*t*
 per individual in science and engineering occupation, 8.98*f*, 8.99*t*
 by top corporations, 4.51*t*
 China, O.4–5, O.5*f*
 distribution of, among states, 4.11, 4.12*t*
 European Union, O.4–5, O.4*f*, O.5*f*
 global expansion of, O.4–5
 global patterns of, 4.40–42
 growth in, O.5*f*
 India, O.5*f*
 international comparisons, 4.40–52
 Japan, O.4–5, O.5*f*
 location of, O.6*f*
 Malaysia, O.5*f*
 performer vs. source reported, 4.34
 Singapore, O.5*f*
 South Korea, O.4, O.5*f*
 Taiwan, O.5*f*
 total U.S., 4.10*f*
 United States, O.4–5, O.4*f*, O.5*f*
 worldwide, O.4*f*
 EPSCoR and, 5.11, 5.12
 exports and imports of services in, 4.27–28
 federal, 4.28–37
 by agency, 4.31–33, 4.32*f*
 by field, 4.33–35, 4.37*f*
 by national objective, 4.28–30
 by performer, 4.31–33
 civilian-related, 4.30
 defense-related, 4.28–30
 in federal budget, 4.28–30, 4.31*f*
 obligations per civilian worker, 8.90*f*, 8.91*t*
 obligations per individual in science and engineering occupation, 8.92*f*, 8.93*t*
 tax credits, 4.35–37
 federal legislation related to, 4.39
 foreign direct investment in, 4.25
 funding sources, 4.12–15
 business as, 4.12–13
 federal government as, 4.13–15
 government priorities, 4.46–48
 in business sector, 4.9–11
 in federal agencies, 4.12
 in universities and colleges, 4.11
 industries in, largest, 4.19–23
 international comparisons, 4.40–52
 location of performance, O.6, 4.11

obligations, 4.30–33, 4.32*t*, 4.33*f*, 4.35*t*, 4.36*f*, 4.37*f*
 outlays, 4.30, 4.34, 4.34*f*
 overseas, by multinational companies, O.5–6, 4.25
 performers of, 4.8–12
 plant, 4.30
 social science, 4.8
 software, 4.21, 4.22*t*
 trends, 4.7–17
 unmeasured, 4.8
 workforce performing, 3.25–27
 Researchers
 expansion of global pool, O.8–9, 3.56–57
 Rhode Island. See *Chapter 8*
 Romania
 journal articles from, 5.34*t*
 research and development expenditures as share of GDP, 4.45*t*
 Russia
 coauthorship from, with United States, 5.39*t*
 educational attainment in, 2.33*f*
 first university degrees in, O.7*f*
 foreign students in, 2.36*f*
 GDP in, by sector, 4.44*f*
 H-1B holders from, 3.51*f*
 journal articles from, 5.34*t*
 patent trends in, 6.50
 research and development expenditures as share of GDP, 4.45*t*, 4.46*f*
 researcher numbers in, O.9*f*

S

Salaries
 at different degree levels, 3.32–33, 3.34*f*
 differentials in, of minorities and women, 3.45–47
 employer characteristics and, 3.46–47
 family characteristics and, 3.47
 field of degree and, 3.46–47
 for doctorate recipients, 3.36
 of H-1B visa holders, 3.50, 3.52*t*
 personal characteristics and, 3.46–47
 teacher (precollege), 1.28, 1.30*f*, 8.28*f*, 8.29*t*
 Saudi Arabia, enrollment in U.S. undergraduate programs, 2.19*f*
 SBIR. See Small Business Innovation Research (SBIR)
 Science (precollege)
 eighth grade performance in, 8.24*f*, 8.25*t*
 eighth grade proficiency in, 8.26*f*, 8.27*t*
 fifteen-year-olds' performance in, 1.15
 fourth grade performance in, 8.16*f*, 8.17*t*
 fourth grade proficiency in, 8.18*f*, 8.19*t*
 public attitudes about education in, 7.44
 rising performance in, 1.13
 Science and engineering (S&E)
 advanced degrees in, share of, 8.54*f*, 8.55*t*, 8.56*f*, 8.57*t*
 associate's degrees, 2.20
 bachelor's degrees, 2.20–22
 by citizenship, 2.22
 by field, 2.18*f*
 by race/ethnicity, 2.21–22, 2.22*f*
 female share of, 2.21*f*
 minority share of, 2.22*f*
 per 1,000 18–24-year-olds, 8.44*f*, 8.45*t*
 in charter schools, 1.11
 degrees as share of total degrees, 8.48*f*, 8.49*t*, 8.50*f*, 8.51*t*
 doctoral degrees, O.8*f*, 2.26–31
 article output per 1,000 holders of, 8.106*f*, 8.107*t*
 by citizenship, 2.29*f*
 by country/economy of origin, 2.29–31, 2.30*f*, 2.30*t*, 2.31*t*
 by field, 2.27*f*

- by race/ethnicity, 2.27–28, 2.28*f*
- by sex, 2.27
- completion and, 2.27
- conferred per 1,000 employed holders of, 8.104*f*, 8.105*t*
- foreign recipients, 2.28, 2.29–31, 2.30*t*, 2.31*t*
- global comparison of, 2.34
- labor market for, 3.34–36
- patents per 1,000, 8.110*f*, 8.111*t*
- salaries for, 3.36
- stay rates, 3.50–52, 3.53*f*
- tenure-track positions for, 3.35–36
- time for completion, 2.27, 2.28*t*
- unemployment of, 3.35
- first university degrees in, 2.32–34
- graduate education
 - enrollment in, 2.24–25
 - by race/ethnicity, 2.26, 2.26*f*
 - by sex, 2.25
 - foreign students, 2.24–25
 - financial support for, 2.13–15, 2.13*t*, 2.14*f*, 2.15*t*
 - interdisciplinary, 2.25
 - per 1,000 25–34-year-olds, 8.52*f*, 8.53*t*
- international education, 2.32–37
- master's degrees, 2.25–26
 - by citizenship, 2.26
 - by field, 2.25*f*
 - by race/ethnicity, 2.26, 2.26*f*
 - by sex, 2.25, 2.25*f*
 - professional, 2.25
- public views on occupations in, 7.33–34
- ratio of degrees in, to college-age population, 2.32
- reasoning and understanding of scientific process, 7.23–26
- undergraduate enrollment in, U.S., 2.16–19
- workforce. *See also* Workforce
 - age, 3.52–56, 3.54*f*, 3.55*f*
 - demographics, 3.40–56
 - earnings, 3.32–33
 - at different degree levels, 3.32–33, 3.34*f*
 - growth, 3.33*t*
 - education classification, 3.8, 3.9*t*
 - educational distribution of, 3.14–15
 - employer sizes, 3.19–20, 3.20*f*
 - employment growth, 3.12, 3.12*f*
 - employment patterns, 3.17–29
 - employment sectors, 3.18–19, 3.22–25
 - federal employment of, 3.24
 - global, 3.56–61
 - counts of, 3.56–57
 - migration of, 3.57–58
 - growth of, 3.10–13, 3.13*t*, 3.14*f*
 - higher education and trends in, 0.7–8
 - immigrants in, 3.47–52, 3.57–58
 - in academic research and development, 5.19–25
 - in metropolitan areas, 3.21–22, 3.21*t*, 3.22*t*
 - in research and development, 3.25–27
 - labor market conditions, 3.29–40
 - minorities in, 3.43–3.47
 - age distribution of, 3.41*f*, 3.44
 - salary differentials of, 3.45–3.47
 - non-S&E occupation employment of, 3.15–16
 - occupation classification, 3.7
 - occupation density by industry, 3.20
 - patenting activity of, 3.28
 - postdoc positions, 3.36–40, 3.38*f*, 3.39*t*
 - recent graduates in, 3.33
 - doctorate recipients, 3.34–36
 - labor market indicators for, 3.33–34
 - relationship of education and employment of, 3.16–17
 - retirement patterns, 3.52–53
 - self-employment in, 3.23–24
 - size of, 3.10, 3.10*t*
 - technical expertise classification, 3.8, 3.9
 - tenure-track positions, 3.35–36
 - training, 3.29
 - unemployment, 3.29–31, 3.32*f*
 - of doctorate recipients, 3.35
 - women in, 3.40–43, 3.40*f*
- Science and technology (S&T)
 - attitudes about specific issues in, 7.34–44
 - general attitudes about, 7.27–34
 - confidence in leadership in, 7.31–32, 7.31*t*
 - influence on public issues of experts in, 7.32–33
 - promise of, 7.28–29
 - reservations about, 7.28–29
 - public interest in, 7.12–14
 - public involvement in informal learning, 7.16–18
 - public knowledge about, 7.18–27
 - sex differences in, 7.21*t*
 - statistics and charts, understanding of, 7.26
 - terms and concepts, understanding of, 7.19–23
 - sources of public's information about, 7.6–18
 - blending of print and online coverage of, 7.11, 7.11*t*
 - current events primary sources on, 7.10*f*
- Serbia, journal articles from, 5.34*t*
- Singapore
 - coauthorship from, with United States, 5.39*t*
 - information and communication technology
 - exports, 6.35*f*
 - imports, 6.37*f*
 - international collaboration on articles in, 5.38*t*
 - journal articles from, 5.34*t*
 - in engineering, 0.11*f*
 - research and development by U.S. companies in, 4.29*t*
 - research and development expenditures, 0.5*f*
 - as share of GDP, 4.45*t*
 - researcher numbers in, 0.9*f*
- Slovak Republic
 - educational attainment in, 2.33*f*
 - high school graduation rate in, 1.33*f*
 - research and development expenditures as share of GDP, 4.45*t*
- Slovenia
 - educational attainment in, 2.33*f*
 - journal articles from, 5.34*t*
 - research and development expenditures as share of GDP, 4.45*t*
- Small business
 - angel investment in, 6.57–58, 6.58*f*, 6.59*f*
 - employment in, 3.19–20
 - federal programs, 4.38–40
 - financing of, 6.56–60
 - leading types, 6.56*t*
 - venture capital investment in, 6.58–60, 6.59*f*
- Small Business Innovation Research (SBIR), 4.38–39
 - funding per \$1 million of GDP, 8.120*f*, 8.121*t*
- Smithsonian Institution, 4.32*t*, 4.35*t*
- South Africa
 - coauthorship from, with United States, 5.39*t*
 - journal articles from, 5.34*t*
 - research and development by U.S. companies in, 4.29*t*
 - research and development expenditures as share of GDP, 4.45*t*
- South Carolina. *See Chapter 8*
- South Dakota. *See Chapter 8*
- South Korea

- broadband penetration in, 6.17f
 - coauthorship from, with United States, 5.39t
 - doctoral degrees in, 0.8f
 - doctorate recipients from, 2.29t, 2.29f
 - educational attainment in, 2.33f
 - enrollment in U.S. undergraduate programs, 2.19f
 - exports to China, 0.18f
 - exports to United States, 0.18f
 - first university degrees in, 0.7f
 - foreign students in tertiary education in, 2.36f
 - GDP in, by sector, 4.44f
 - H-1B visa holders from, 3.51f
 - high school graduation rate in, 1.33f
 - immigrants from, education of, 3.53f
 - industrial research and development in, 4.45t
 - information and communication technology exports, 6.35f
 - international collaboration on articles in, 5.38t
 - journal articles
 - from, 5.34t
 - engineering, 0.11f
 - research and development by U.S. companies in, 4.29t
 - research and development expenditures, 0.4, 0.5f
 - as share of GDP, 4.45t, 4.46f
 - researcher numbers in, 0.9f
 - stay rates of doctorate recipients from, 3.53f
- Spain**
- article collaboration in, 5.38t
 - coauthorship from, with United States, 5.39t
 - educational attainment in, 2.33f
 - foreign students in, 2.36f
 - high school graduation rate in, 1.33f
 - industrial research and development in, 4.45t
 - journal articles from, 5.34t
 - research and development expenditures as share of GDP, 4.45t
- State achievement tests, 1.23**
- State indicators. See Chapter 8**
- Statistics, public understanding of, 7.26**
- Stem cell research, public attitudes about, 7.40–41**
- Students (precollege). See also Education**
- access to qualified teachers, 1.26, 1.26t
 - in charter schools, in United States, 1.11
 - mathematics performance
 - achievement gaps, 1.13, 1.13t
 - by race/ethnicity, 1.10t
 - eighth grade, 1.9–12 1.10f, 1.10t, 1.11f, 1.12t, 1.13t, 8.20f, 8.21t
 - elementary, 1.8–12, 1.10t
 - fifteen-year-olds, 1.15
 - fourth grade, 1.9–12 1.10f, 1.10t, 1.11f, 1.12t, 1.13t, 8.12f, 8.13t
 - middle grade, 1.8–12
 - proficiency in different skill areas, 1.15–16, 1.15f
 - skills areas, 1.14
 - national assessment performance on, 1.7–15
 - science performance
 - achievement gaps in, 1.13
 - eighth grade, 8.24f, 8.25t
 - fifteen-year-olds, 1.15
 - rising, 1.13
 - tracking systems, 1.33
- Supercomputers, in China, 6.25, 6.25f**
- Sweden**
- coauthorship from, with United States, 5.39t
 - educational attainment in, 2.33f
 - high school graduation rate in, 1.33f
 - industrial research and development in, 4.45t
 - international collaboration on articles in, 5.38t
 - journal articles from, 5.34t
 - research and development by U.S. companies in, 4.29t
 - research and development expenditures as share of GDP, 4.46f, 4.47t
- Switzerland**
- article collaboration in, 5.38t
 - coauthorship from, with United States, 5.39t
 - educational attainment in, 2.33f
 - foreign students in, 2.36f
 - high school graduation rate in, 1.33f
 - journal articles from, 5.34t
 - research and development by U.S. companies in, 4.29t
- T**
- Taiwan**
- coauthorship from, with United States, 5.39t
 - doctorate recipients from, 2.29t, 2.29f
 - exports to China, 0.18f
 - exports to EU, 0.18f
 - exports to United States, 0.18f
 - H-1B visa holders from, 3.51f
 - information and communication technology exports, 6.35f
 - journal articles
 - from, 5.34t
 - in engineering, 0.11f
 - research and development expenditures, 0.5f
 - as share of GDP, 4.47t
 - researcher numbers in, 0.9, 0.9f
 - stay rates of doctorate recipients from, 3.53f
- Tax credits, federal research and development, 4.35–37**
- Teachers (precollege)**
- attrition of, 1.29
 - certification of, 1.22–24
 - experience of, 1.25
 - formal preparation of, 1.22–25
 - professional development of, 1.26–28, 1.27f, 1.28f
 - quality of, 1.22–25
 - salaries of, 1.28, 1.30f, 8.28f, 8.29t
 - subject area preparation of, 1.25–26, 1.26t
 - working conditions, 1.28–30, 1.31f
- Technology. See Knowledge- and technology-intensive (KTI) industries; Science and technology (S&T)**
- Technology-intensive firms. See also Knowledge- and technology-intensive (KTI) industries**
- rising output of, 0.15–16
- Texas. See Chapter 8**
- research and development in, 4.12t
- Thailand**
- doctorate recipients from, 2.29t
 - first university degrees in, 0.7f
 - journal articles from, 5.34t
- Trade**
- balance in selected regions/countries, 0.19f
 - exports and patterns in, 0.17–18
 - knowledge- and technology-intensive industries and, 6.29–46
 - of high-technology goods, 6.34–36
 - product classification in, 6.38
 - shifts in positions, 0.17–18
 - surpluses in U.S., 0.18–19
- Tunisia**
- journal articles from, 5.34t
- Turkey**
- coauthorship from, with United States, 5.39t
 - doctorate recipients from, 2.29t
 - educational attainment in, 2.33f
 - foreign students in, 2.36f
 - H-1B visa holders from, 3.51f
 - high school graduation rate in, 1.33f
 - journal articles from, 5.34t
 - stay rates of doctorate recipients from, 3.53f

U

U.S. Patent and Trademark Office (USPTO), 6.48–53

Ukraine

journal articles from, 5.34*t*

United Kingdom

article collaboration in, 5.38*t*

broadband penetration in, 6.17*f*

coauthorship from, with United States, 5.39*t*

educational attainment in, 2.33*f*

first university degrees in, 0.7*f*

foreign students in, 2.36*f*

GDP in, by sector, 4.44*f*

H-1B visa holders from, 3.51*f*

high school graduation rate in, 1.33*f*

industrial research and development in, 4.45*t*

international collaboration on articles in, 5.38*t*

journal articles from, 5.34*t*

research and development by U.S. companies in, 4.29*t*

research and development expenditures as share of GDP, 4.46*f*, 4.47

stay rates of doctorate recipients from, 3.53*f*

Universities, patenting trends, 5.45

USDA. *See* Department of Agriculture (USDA)

USPTO. *See* U.S. Patent and Trademark Office (USPTO)

Utah. *See* *Chapter 8*

V

VA. *See* Veterans Administration

Value added

definition of, 6.11

of commercial knowledge-intensive services, 6.24*f*

of education and health services, 6.13*t*

of information and communication technology industries, 6.21*f*,
6.24*f*, 6.25–26

of knowledge- and technology-intensive industries, global, 6.12*f*

Venture capital

by industry, 6.58, 6.59*f*

by share of investment stage, 6.59–60, 6.59*f*

deals as share of high-technology business, 8.124*f*, 8.135*t*

disbursed per venture capital deal, 8.126*f*, 8.127*t*

in small businesses, 6.58–60

per \$1,000 of GDP, 8.122*f*, 8.123*t*

Vermont. *See* *Chapter 8*

Veterans Administration (VA), 4.32*t*, 4.35*t*

Vietnam

enrollment in U.S. undergraduate programs, 2.19*f*

Virginia. *See* *Chapter 8*

Visas, work, 3.49–50, 3.52*t*

W

Washington. *See* *Chapter 8*

research and development in, 4.12*t*

West Virginia. *See* *Chapter 8*

Wisconsin. *See* *Chapter 8*

Women

as faculty at research universities, 5.22, 5.23*t*

first university degrees by, 2.33–34

in academic research and development, 5.22–23

in S&E workforce, 3.40–43, 3.40*f*

age distribution of, 3.41*t*

salary differentials of, 3.45–46

unemployment among, 3.42

share of S&E bachelor's degrees, 2.21*f*

Workforce. *See also* Science and engineering, workforce

bachelor's degree holders potentially in, 8.74*f*, 8.75*t*

computer specialists as share of, 8.84*f*, 8.85*t*

employed science and engineering degree holders as share of, 8.78*f*, 8.79*t*

engineers as share of, 8.80*f*, 8.81*t*

life scientists as share of, 8.82*f*, 8.83*t*

physical scientists as share of, 8.82*f*, 8.83*t*

science and engineering

age, 3.52–56, 3.54*f*, 3.55*f*

as share of total workforce, 8.76*f*, 8.77*t*

demographics, 3.40–56

earnings, 3.32–35

at different degree levels, 3.32–33, 3.34*f*

growth, 3.33*t*

education classification, 3.8, 3.9*t*

educational distribution of, 3.14–15

employer sizes, 3.19–20, 3.20*f*

employment growth, 3.12, 3.12*f*

employment patterns, 3.17–29

employment sectors, 3.18–19, 3.22–25

federal employment of, 3.24

global, 3.56–61

counts of, 3.56–57

migration of, to U.S., 3.57–58

growth of, 3.10–13, 3.13*t*, 3.14*f*

higher education and trends in, 0.7–8

in academic research and development, 5.19–25

in metropolitan areas, 3.21–22, 3.21*t*, 3.22*t*

in research and development, 3.25–27

labor market conditions, 3.29–40

minorities in, 3.43–47

age distribution of, 3.41*f*, 3.44

salary differentials of, 3.45–47

non-S&E occupation employment of, 3.15–16

occupation classification, 3.7

occupation density by industry, 3.20

patenting activity of, 3.28

postdoc positions, 3.36–40, 3.38*f*, 3.39*t*

recent graduates in, 3.33

doctorate recipients, 3.34–36

labor market indicators for, 3.33–34

relationship of education and employment of, 3.16–17

retirement patterns, 3.52–53

self-employment in, 3.23–24

size of, 3.10, 3.10*t*

technical expertise classification, 3.8, 3.9

tenure-track positions, 3.35–36

training, 3.29

unemployment, 3.29–32, 3.30*f*

of doctorate recipients, 3.35

women in, 3.40–43, 3.40*f*

Work visas, 3.49–50, 3.52*t*

Wyoming. *See* *Chapter 8*